prior to transmission. The unique manner in which the synchronization information is inserted permits complete recovery of the original input data stream without loss of any data.

In accordance with the present invention, a sequence of consecutively ordered signal samples comprising the input data stream is monitored for the occurrence (if any) of two (2) consecutive identical samples. If two such consecutive, identical samples are found, the second one of the identical samples is replaced in the input data stream by a sync symbol representing synchronization information. In effect, the presence of a sync symbol indicates that the transmission slot now holding the sync symbol once held a signal sample which is identical to the signal sample in the immediately preceding slot.

For example, in the input data stream ("DATA IN") of Figure 2, where signal sample BYT3 is identical to BYT4 (BYT3=BYT4) and sample BYT6 is identical to BYT7 (BYT6=BYT7), the present invention processes this exemplary data stream by replacing the second-occurring identical sample (e.g., samples BYT4 and BYT7) with a sync symbol ("SYNC") to produce the "SERIAL OUT" stream for transmission.

Once the appropriate replacements with the sync symbol are made in the input data stream, the stream is transmitted to a receiving end where the received stream is monitored for each occurrence (if any) of a sync symbol. If a sync symbol is detected, the symbol is removed (and used to provide synchronization), and the slot once holding the sync symbol is now filled with a signal sample identical to the one in the immediately previous slot. Thus, the original input signal stream (prior to any sync symbol substitution at the transmission end) is completely recovered.

For example, in Figure 4 where the received signal stream ("DATA IN") is monitored for the occurrence of each and any SYNC symbol, the slot holding the first SYNC symbol is replaced by a signal sample identical to the one in the immediately previous slot (e.g., BYT3), while the slot holding the second SYNC symbol

is likewise replaced by a signal sample identical to the one in the immediately previous slot (e.g., BYT6). The resultant output data stream ("DATA OUT") is a perfect replication of the original input data stream ("DATA IN") from Fig. 2 (where BYT3=BYT4 and BYT6=BYT7).

Accordingly, a key aspect of the present invention is detecting the occurrence of any two consecutive identical samples in an input stream of consecutively ordered signal samples, and replacing the second-occurring one of the two consecutive identical samples with a sync symbol. At a receive end, complete reconstruction of the original input signal stream is made possible by removing each sync symbol and inserting in that slot (which held the sync symbol) a signal sample which is identical to the sample in the immediately previous slot.

However, Whittington neither teaches nor suggests replacing the second-occurring one of two consecutive signal samples with a sync symbol. Rather, Whittington teaches that sync information is to be inserted in the idle sequence (323) between signals such as "MESSAGES" 321 and 331 in Fig. 3. (see page 3, lines 16-18, 22-24; page 4, lines 31-32). In particular, a predetermined number of 1's from the "all 1's" sequence 323 in the idle period between messages is replaced with an imbedded sequence of synchronization bits. There is no signal processing performed on the MESSAGES portion in any HDLC frame.

In order to more clearly illustrate the significant differences between the teachings of Whittington and the present invention, applicants will indicate below how the principles of the present invention would operate upon the HDLC-type data link used by Whittington.

If the HDLC-type data link used by Whittington were processed in accordance with the present invention, the sequence of HDLC frames would be monitored to detect the occurrence (if any) of two consecutive identical messages, and then the second-occurring identical message would be replaced with a sync symbol. For example, in the exemplary data link of Fig. 3, if the information

in MESSAGE 331 is identical to the information in MESSAGE 321, MESSAGE 331 would be replaced by a sync symbol at the transmission end. At the receive end, the sync symbol would be detected, and the information from MESSAGE 321 (which is identical to that in MESSAGE 331) would be inserted into the frame slot once occupied by MESSAGE 331.

However, with respect to the Whittington teachings for including synchronization information in the transmission stream, Whittington does not perform any comparison between consecutive messages to detect an identicality condition, nor does Whittington substitute synchronization information for any one of the messages. Rather, synchronization information is placed into the transmission stream by inserting a sequence of imbedded sync bits ("IMBED BITS" 325) into the "all 1's" idle sequence 323 between messages.

Applicants acknowledge the Examiner's statement that "Whittington teaches a data link for cellular radio systems which replaces eight identical consecutive bits with a like number of synchronization bits." (emphasis added) However, these "eight identical consecutive bits" are part of an all 1's idle sequence between messages, and not themselves part of any message. In comparison, the present invention replaces the second-occurring one of two (2) consecutive identical signal samples (e.g., messages) with a sync symbol.

Applicants believe that claims 1-7 are patentable over the teachings of Whittington, and respectfully request that this rejection be withdrawn.

Applicants believe that the application is now in condition for allowance, and respectfully request that such action be taken.

Respectfully submitted,

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